



**GEOLOGIC MAP OF THE LUCIN NW QUADRANGLE,
BOX ELDER COUNTY, UTAH**

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DESCRIPTION OF MAP UNITS

<div>Qf</div>	Fill (Holocene) - Local material used to construct railroad grades.
<div>Qal</div>	Alluvium (Holocene) - Gravel, sand, silt, and mud deposited in active washes. In many washes, consists primarily of reworked lacustrine marl.
<div>Qaf</div>	Younger alluvial-fan deposits (Holocene) - Gravel, sand, and silt forming alluvial cones and fans, most of which issue from mountainous parts of quadrangle. Alluvial fans overlie deposits of Lake Bonneville.
<div>Qai</div>	Alluvial silt (Holocene) - Silt, sand, and clay deposited by streams on the broad plain bordering Grouse Creek in northeastern part of quadrangle. Also present in depressions bounded by lacustrine beaches.
<div>Qam</div>	Alluvial mud (Holocene) - Mud ponded in depressions behind lacustrine beaches. Typically coated by white reflective clay.
<div>Qmc</div>	Mass-movement colluvium (Holocene) - Unconsolidated colluvial materials on steep slopes in the northwestern part of the quadrangle.
<div>Qes</div>	Eolian sand and silt (Holocene) - Sand dunes and sheets of brown sand and silt. Deposits primarily flank Grouse Creek
<div>Qla</div>	Lacustrine and alluvial deposits, undivided (Holocene and Pleistocene) - Interlayered deposits of lacustrine and alluvial origins. In most places, unit consists of thin sheets of fine-grained alluvium on erratically exposed lacustrine marl and silt.
<div>Qlms</div>	Lacustrine marl and sand (Pleistocene) - Marl, sand, and sandy marl deposited near Provo shoreline. Marl at base grades upward to sandy marl and sand as thick as 30 m (100 ft).
<div>Qlm</div>	Lacustrine marl (Pleistocene) - White and gray marl and clay, locally containing considerable silt deposited as deltaic facies.
<div>Qlf</div>	Lagoon fines (Pleistocene) - Unconsolidated, poorly sorted, fine-grained sediment; in most places, deposited between barrier beaches.
<div>Qls</div>	Lacustrine sand (Pleistocene) - Coarse sand and fine pebbles. In most places medium gray due to predominance of rhyolite clasts.
<div>Qlgs</div>	Lacustrine gravel and sand (Pleistocene) - Gravel and coarse to medium sand. Forms narrow barrier beaches and sheets along upper part of Grouse Creek.
<div>Qlg</div>	Lacustrine gravel (Pleistocene) - Cobble- and pebble-gravel and subordinate sand. Forms prominent barrier beaches.
<div>Qaf₂</div>	Older alluvial-fan deposits (Pleistocene) - Moderately consolidated gravel, sand, and silt forming broad fans among mountains in northwest part of quadrangle.
<div>Tbt</div>	Biotite tuff breccia (Miocene) - Biotite tuff breccia containing blocks of moderately-to well-welded biotite rhyolite tuff in ash matrix. Locally includes welded biotite rhyolite ash-flow tuff in lower part. K-Ar ages are about 13 million years.
<div>Tsr</div>	Siliceous rhyolite (Miocene) - Resistant dark-red, brown, and black highly silicified rock containing 5 percent fine- to medium-grained quartz and altered sanidine. Locally includes underlying thin, black vitrophyre.
<div>Ta</div>	Ash-flow and air-fall deposits (Miocene) - Moderately to well-lithified, light-yellow deposits of (1) lithic air fall, (2) massive, variable welded ash, (3) tuff breccia, (4) debris-flow or lahar deposits, and (5) welded-ash flow. Most rocks are rhyolitic. Interfingers with Tr.
<div>Ts</div>	Sedimentary and volcanic rocks (Miocene) - Moderately lithified, thin-bedded siltstone, sandstone, shale, and conglomerate. All rocks are commonly tuffaceous. Typically white, yellow, yellowish brown in color. Locally contains air-fall tuff with blocks up to 40 centimeters (17 in).
<div>Tr</div>	Rhyolite (Miocene) - Resistant, brown-weathering, medium-gray, quartz-sanidine rhyolite. Typically well foliated; outcrops exhibit cavernous weathering and prominent joints. Phenocrysts are medium to coarse grained and comprise 15 to 20 percent of the rock. Includes several cooling units and flows. K-Ar ages are 8 to 9 million years.
<div>Trv</div>	Rhyolite vitrophyre (Miocene) - Black, cliff-forming vitrophyre lying under and above rhyolite flows (Tr). Locally contains abundant geodes.
<div>Twa</div>	Welded ash (Miocene) - Pale-brown, moderately welded, air-fall rhyolite carrying rhyolite vitrophyre fragments. Locally grades upward to massive rhyolite vitrophyre (Trv).
<div>Trb</div>	Rhyolite breccia (Miocene) - Black, maroon, and brown breccia forming massive deposits. Most rhyolite clasts are fine-grained (Trf). Deposit is widely silicified.
<div>Trf</div>	Fine-grained rhyolite (Miocene) - Resistant gray rhyolite with fine- to medium-grained quartz and sanidine phenocrysts composing about 10 to 15 percent of the rock. Numerous small vugs are lined by chalcedony.

<div>Tda</div>	Dacite ash flow (Miocene) - Welded hornblende dacite tuff blocks in a moderately welded ash matrix.
<div>Tdf</div>	Dacite lava flows and domes (Miocene) - Hornblende dacite, fine to medium grained; generally strongly foliated; forms rubby hills. Locally includes avalanche deposits.
<div>Tc</div>	Conglomerate (Miocene) - Moderately lithified, well-sorted pebble conglomerate.
<div>Trd</div>	Dinwoody Formation (Triassic) - Yellow, red, and brown, thin- to medium-bedded, impure limestone, calcareous shale, and siltstone; siliceous in places.
<div>Pm</div>	Murdock Mountain Formation (Permian) - Dark- to pale-brown, thin-bedded chert and cherty dolomite; typically highly fractured.
<div>Pu</div>	Altered sandstone, undivided (Permian) - Jasperoid and silicified sandstone.
Phosphoria Formation (Permian)	
<div>Ppm</div>	Meade Peak Phosphatic Shale Tongue - Dark-gray, dark-brown, and black shale, siltstone, and gray limestone; thin-bedded; poorly exposed.
Park City Group (Permian)	
<div>Ppg</div>	Grandeur Formation - Light-gray, sandy dolomite and medium-brown, dolomitic sandstone; medium to thick bedded.
<div>bx</div>	Breccia (Devonian?) - Dark-brown and red-brown siliceous breccia overlying limestone of the Guilmette Formation. Altered sandstone is lithologically identical to sandstone in upper part of Guilmette.
<div>Dg</div>	Guilmette Formation (Devonian?) - Medium-and dark-gray and black, medium-crystalline limestone; fossiliferous; locally dolomitic.
<div>Ds</div>	Simonson Dolomite (Devonian) - Alternating black and medium-gray thick beds of coarsely recrystallized dolomite; typically laminated.
<div>Ptc</div>	Trapper Creek Formation (Permian) - Calcareous sandstone, thin- to medium-bedded. Shown in cross section only.

Formation	Symbol	Thickness meters (feet)	Lithology
Lava flows and domes, tuff, tuff breccia, flow breccia	Tbt, Tsr, Ta, Tr, Trv, Twa, Trb, Trf, Tda, Tdf	Variable	
Sedimentary and volcanic rocks (Tc, conglomerate)	Ts	>300 (1000)	
Dinwoody Formation	Trd	110 (360)	
Murdock Mountain Formation [Altered sandstone (Pu) of probable Permian age locally present]	Pm	420 (1380)	
Meade Peak Phosphatic Shale Tongue of the Phosphoria Fm	Ppm	105 (344)	
Grandeur Formation	Ppg	300 (1000)	
Not exposed Uncertain structure and stratigraphy			
Breccia	bx	>82 (270)	
Guilmette Formation	Dg	82 (270)	
Simonson Dolomite	Ds	70 (230)	

MAP SYMBOLS

	CONTACT - Dotted where covered, dashed where gradational
	HIGH-ANGLE FAULT - Dashed where location inferred, dotted where concealed; bar and ball on downthrown side; dip indicated; queried where uncertain
	FAULT PARALLEL TO BEDDING - Dotted where concealed
ORIENTATION OF BEDDING	
	Inclined
	Vertical
ORIENTATION OF IGNEOUS FOLIATION (Flow banding)	
	Inclined
	Vertical
	LINEATION - Showing trend and plunge
	DIRECTION OF SEDIMENT TRANSPORT
LOCATION OF GEOCHRONOLOGY SAMPLE	
	BONNEVILLE SHORELINE
	INTERMEDIATE SHORELINE
	PROVO SHORELINE
	REGRESSIVE SHORELINE
	THIN DEPOSITS RESTING ON OTHER DEPOSITS

CORRELATION OF MAP UNITS

